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AIR COMMAND AND STAFF COLLEGE

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**A FUTURE WITH THE UNITED STATES AIR FORCE
ADVANCED MAINTENANCE AND MUNITIONS OPERATIONS
SCHOOL: SECURING STRATEGIC AGILITY THROUGH 2036**

by

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Abstract

In 2003, in response to lessons learned from Operation ALLIED FORCE, former CSAF General John P. Jumper forged the evolution and refinement of maintenance and logistics officer training in the USAF. It was at this time his vision for advanced maintenance officer education culminated in the creation of the USAF Advanced Maintenance and Munitions Operations School (AMMOS). For 12 years AMMOS' Combat Support Course (CSC) provided the Air Force's premier advanced maintenance officer training to expand combat capability through graduate-level education of the Agile Combat Support master processes. However, in 2015 the CSC stood down to undergo a dramatic change which caused the school to sever ties with its expeditionary-centered origins for a concentration on home station sortie generation operations. This transformation is one which may place maintenance and logistics officer education back into a pre-2003 mindset. Since the Air Force is always in pursuit of training approaches that cultivate Airmen as experts in their craft, current training that has refined a career field, remains important as well. This paper argues that in preparing for the challenges the Air Force will face through 2036, the CSC needs to be retained in order to ensure the Service continues to produce highly skilled, mid-level operational logisticians who possess an enhanced expeditionary logistics skill set and expertise in all aspects of ACS.

Contents

Disclaimer	ii
Abstract	iii
Contents	iv
List of Illustrations	v
List of Tables	vi
Introduction.....	[page 1]
Jumper's Vision	[page 2]
USAF AMMOS: Forming an Institution	[page 5]
The Pinnacle of AMMOS: 2003-2013.....	[page 8]
A Vision Depleted: 2013-2015	[page 11]
AMMOS: The Current Path.....	[page 12]
The Need for 21X Tactical Level Advanced Education.....	[page 13]
A Future with AMMOS: Securing Strategic Agility through 2036.....	[page 15]
Conclusion	[page 19]
End Notes.....	[page 21]
Bibliography	[page 23]

Illustrations

Figure 1: [COA 3: Basic Course Flow] [page 18]



Tables

Table 1: [Air Expeditionary Force Logistics School Curriculum Strawman]	[page 6]
Table 2: [USAF AMMOS COAs]	[page 17]
Table 3: [USAF AMMOS COA Costs]	[page 17]



Introduction

Since 1947, the United States Air Force (USAF) has experienced rapid changes in the way the Service performs its roles to best complement our nation's warfighting capability. Fueled by technology, innovation, and leadership the evolution of the USAF has endured countless challenges, but amidst them all its five core missions have remained intact: air and space superiority; intelligence, surveillance, and reconnaissance; rapid global mobility; global strike; and command and control.¹ These missions provide the Service the ability to rapidly respond to conflicts anywhere around the world to protect and promote United States (US) national interests. One of the most important responsibilities of the USAF is to prepare for the challenges of tomorrow, not just the realities of today.² This requires foresight and a level of organization and training that is ready to operate in environments which are heavily contested, degraded, and operationally limited. In *America's Air Force: A Call to the Future*, Chief of Staff of the Air Force (CSAF) General Mark A. Welsh III stated, "Our purpose is to ensure the Air Force can always provide responsive and effective Global Vigilance—Global Reach—Global Power...We are the globally responsive force – always ready. We measure our responsiveness in minutes and hours, not weeks or months. We deliver these contributions through unmatched execution of our five core missions...Courageous Airmen have forged the evolution and refinement of these core missions with their blood and sacrifice, ensuring they will endure long into the future."³

In 2003, former CSAF General John P. Jumper forged the evolution and refinement of maintenance and logistics officer (21X Air Force Specialty Code) training in the USAF. It was at this time his vision for advanced maintenance officer education culminated in the creation of the USAF Advanced Maintenance and Munitions Operations School (AMMOS). Similar to that

of the USAF Weapons School the AMMOS Combat Support Course (CSC) provided the Air Force's premier advanced maintenance training to expand combat capability through graduate-level education of the Agile Combat Support (ACS) master processes.⁴ Since inception, AMMOS has undergone minor modifications, but at its core, the curriculum has remained focused on its mission: *to prepare USAF maintenance leaders to win the wars of tomorrow.*⁵ However, over the past year, the CSC has stood down to undergo a dramatic change to remove the tactical-level curriculum and focus away from mid-level logisticians. This academic overhaul is one which threatens to sever ties with the school's expeditionary-centered origins for a concentration on home station sortie generation operations. With the new structure currently under review by Air Combat Command (ACC), if approved, this transformation is one which may place 21X education back into a pre-2003 mindset. Since the Air Force is always in pursuit of training approaches that cultivate Airmen as experts in their craft, current training that has refined a career field, remains important as well. This paper argues that in preparing for the challenges the Air Force will face through 2036, the CSC needs to be retained in order to ensure the Service continues to produce highly skilled, mid-level operational logisticians who possess an enhanced expeditionary logistics skill set and expertise in all aspects of ACS.

Jumper's Vision

In 1999, the USAF completed its first major operation since DESERT STORM. Deemed the most precise and lowest collateral damage air campaign in history, the US and its coalition partners achieved all tactical, operational, and strategic objectives of Operation ALLIED FORCE (OAF) during only 78 days of flying operations.⁶ This success story once again displayed how the USAF was responsive and effective in providing global vigilance, global reach, and global power. However, beneath the success of 38,000 combat sorties lie major concerns regarding the

readiness of USAF logistics and maintenance processes.⁷ Highlighted by the Commander, Air Force Forces Logistics Staff (COMAFFOR/A4), three main issues revolved around the concerns presented during OAF: first, aircraft deployed in theater with overdue maintenance and inspection items; second, several aircraft maintenance units arrived at their combat locations lacking essential equipment to perform repair actions; and third, there was a lack of wing-level focus on aircraft maintenance indicators and a long-term plan for fleet management.⁸ This resulted in aircraft spending several days in non-mission capable status unable to support flying operations upon arriving in theater. Additionally, subpar munitions dispersal and resupply efforts, coupled with a lack of in-transit visibility of supply items in the AOR, attracted the attention of the Joint Chiefs, further casting a negative light on logistics operations during OAF.⁹

In response, a United States Air Forces in Europe (USAFE) team led by General John P. Jumper approached then-CSAF, General Michael E. Ryan, about the need to remedy the current Objective Wing structure throughout the Air Force.¹⁰ In his presentation to General Ryan entitled, “Posturing Aircraft Maintenance for Combat Readiness”, General Jumper identified areas of concerns stemming from OAF, which included declining readiness trends, inept warfighting skills, and fragmented lines of authority over maintenance functions at the wing level.¹¹ “The recommended solution was a focused wing structure, with a separate maintenance group, controlling all facets of wing maintenance, an organizational structure similar to the one that had been in place before General Merrill A. McPeak had ordered it changed to the Objective Wing structure in the early 1990s”.¹² Under the Objective Wing, maintenance functions were split between two groups: flightline maintenance and personnel fell under the direction of the Operations Group and back-shop maintenance and personnel fell under the direction of the Logistics Group. Additionally, General Jumper emphasized two main points to General Ryan:

flying and fixing weapon systems. He asserted that they were two of the hardest skillsets that the USAF possessed, and that they require PhD-level expertise, proficiency, and leadership in order to be most effective.¹³ At the time, there was no such education for the maintenance officer or logistician. A recent study had revealed the USAF had no centralized course of instruction for senior captains that provided the leadership skills and knowledge of the tactics, techniques, and procedures (TTPs) required to produce combat sorties and associated combat support in contingency operations.¹⁴

Following General Jumper's presentation, General Ryan directed a CSAF Logistics Review (CLR) throughout the USAF. The review consisted of four focus areas, one of which was to consider leadership development and training for logistics officers and operators.¹⁵ The following excerpt, taken from Lt Col J. Reggie Hall's research paper entitled, "Evolution of the Air Force Expeditionary Logistics School: A Revolutionary Approach to the Employment of Combat Support", provides insight into what would lead to the creation of AMMOS:

In July 1999, the Air Force Chief of Staff initiated the Chief's Logistics Review, a one-year bottom-up assessment of Air Force logistics. One component of the review- a look at the professional development, education, and training of logistics officers- identified a deficiency in integrated logistics training and revealed a gap between the Air Force's Agile Combat Support (ACS) logistics doctrine, air expeditionary force (AEF) strategy, and training of logistics officers.¹⁶

In response to this training deficiency, General Jumper presented a vision for logistics officer education at the CORONA Fall 2000 Conference.¹⁷ This vision aimed at creating highly skilled operational logisticians who would receive a level of career field education far more advanced than the introductory- and intermediate-level courses the USAF offered. This level of education called for officers to become competent in the following wartime skills: operational deployment, beddown, sustainment, combat employment, redeployment, reconstitution, and

command and control.¹⁸ Following CORONA approval, ACC was then tasked to build a cross-functional training course for logistics officers modeled after the USAF Weapons School program. This training was recommended as a solution to bridge the gap among logistics officer training requirements, ACS doctrinal principles, and the AEF employment strategy.

Acting on the task, a group of logistics officers assigned to the 56th Fighter Wing at Luke AFB, Arizona formulated the initial Agile Logistics School concept. This concept led to an Air Command and Staff College academic research project sponsored by Headquarters USAF's Directorate of Maintenance, and was later used by ACC as a baseline for developing an advanced logistic officer school, later named the Air Expeditionary Force Logistics School.¹⁹

USAF AMMOS: Forming an Institution

The original proposal for the Air Expeditionary Force Logistics School was designed to integrate logisticians into the current mix of the USAF Weapons School at Nellis AFB, Nevada. The USAF Weapons School provided graduate-level instructor courses that produced the world's most advanced training in weapons and tactics employment.²⁰ Graduates advanced to hold pivotal positions throughout operational units to ensure organizational readiness and become vital to accomplishing mission success. Although this concept provided the foundation for building a similar school for logisticians, the CSAF decided to keep the two schools separate until the Air Expeditionary Force Logistics School could demonstrate its validity and credibility throughout the logistics community.²¹

Using the Weapons School concept, the framework of the Air Expeditionary Force Logistics School called for developing a selective, in-residence, advanced-level education on the USAF's ACS core competencies: readying the force, preparing the operational environment, positioning the force, employing the force, sustaining the force, and reconstituting the force.

Although, these core competencies aligned with functions of the A4 logistics staff, their employment, as mandated in Air Force Doctrine Document (AFDD) 2, *Organization and Employment of Aerospace Power* (17 February 2000), also prescribed cross-functional logistics tasks as key responsibilities of the A4.²² These tasks included “responsibility for logistics plans, force beddown, transportation, supply, maintenance, services, civil engineering, explosive ordnance disposal, and related logistics activities.”²³ At the time, no logistics or maintenance officer education provided curriculum on such concepts.

Using their established baseline for the school, a curriculum strawman was also established by the logistics team at Luke AFB, which focused on providing advanced-level education in each of the ACS core competencies and cross-functional logistics tasks. This curriculum plan (depicted in Table 1) was created to enhance the professional development of logistics officers and mold experts in the application of expeditionary logistics concepts.²⁴

Table 1. Air Expeditionary Force Logistics School Curriculum Strawman

<i>Block</i>	<i>Location</i>	<i>Duration</i>
1. Instructor Training	Nellis AFB	2 weeks
2. Warrior Prep	Nellis AFB	2 weeks
3. Doctrine History: Lessons Learned, Organizational Structure	Nellis AFB	2 weeks
4. Mobilization/C ² : Aircraft Generation, Fleet Management, Unit Type Code Tailoring	Nellis AFB Fort Dix (AMWC)	3 weeks
5. Deployment/C ² : Strategic Lift, En Route Support, Joint Total Asset Visibility, Global Trans Network	AMWC	2.5 weeks
6. Beddown/Sustainment/C ² : Reception, Base Support Plan, Communications, Reachback, Host Nation Support	Hurlburt Field	2.5 weeks
7. Combat Employment/C ² : Munitions Management/Bomb Buildup, Sortie Generation, Fleet Management, Theater Distribution	Nellis AFB, Beale AFB (AFCOMAC), Hurlburt Field (Blue Flag)	4 weeks

8. Redeployment/Reconstitution/C ² : Planning, En Route Support, Base Closure	Nellis AFB	1 week
9. Mission Employment/C ²	Hurlburt Field or Nellis AFB	3 weeks
	Total	22 Weeks

Adapted from Maj Reggie J. Hall, "Evolution of the Air Force Expeditionary Logistics School: A Revolutionary Approach to the Employment of Combat Support," *Aerospace Power Journal: Spring 2002 Vol xvi., no2.*

With this strawman, the initial 12-person cadre of the logistics school began developing the course curriculum. In 2001, General Jumper's vision became a reality with the approval of the education plan for the Air Expeditionary Force Logistics School at Nellis AFB, Nevada.²⁵

The original mission statement of the Air Expeditionary Force Logistics School was *to train selected mid-to-senior level captain logisticians from Active Duty, Air National Guard, and the Air Reserve Component, in the integration of expeditionary logistics processes at the tactical level.*²⁶ Additionally, the school's vision, as an educational organization, was to instruct mid-level USAF company grade officers in all aspects of the ACS construct; preparing them to produce expeditionary combat airpower, instruct their fellow officers and SNCOs, and advise the personnel they served with. Upon graduating, students would be qualified in all aspects of effects-based logistics as prescribed by the six phases of ACS.²⁷ This advanced level education provided the graduate skillsets of leadership and critical thinking, the operational art of maintenance, aircraft fleet health and readiness, sortie generation and the flying hour program, munitions operations, combat munitions production, and logistics command and control.

Following the ribbon cutting ceremony on 24 January 2003, the Air Expeditionary Force Logistics School began instructing its first 20-week long class composed of maintenance and logistics officers.²⁸

The Pinnacle of AMMOS: 2003-2013

In June, 2003, the Air Expeditionary Force Logistics School graduated its inaugural class. Later that year, Logistics Readiness Officers (21R Air Force Specialty Code) split away from the school and began development of the Advanced Logistics Readiness Officer Course (ALROC) located at Fort Dix, New Jersey.²⁹ Now, focused solely on providing advanced education to maintenance officers (21A/M Air Force Specialty Codes), in 2004 the school was reduced to 14 weeks and renamed the USAF Advanced Maintenance and Munitions Officer School (AMMOS).³⁰ That same year, the school began codifying maintenance and munitions practices across the USAF when it developed the first TTP for aircraft maintenance and munitions. This tactical-level guide bridged the gap between operational doctrine and wing-level maintenance activities by capturing fundamental tactics, best practices, and lessons learned to enhance maintenance operations and mission accomplishment. Additionally, aircraft maintenance and munitions TTPs became the main source of lesson plans and academic development for the school.

Under this construct, AMMOS generated two classes per year, each consisting of 12 officers. AMMOS' primary goal has been to improve the effectiveness of USAF operational wings by producing highly skilled maintenance and munitions officers who are capable of expanding combat capability. CSC classes underwent a rigorous curriculum where students were trained on how to lead an organization's maintenance and munitions functions by being an expert on: execution of a unit's flying hour program, aircraft sortie generation, fleet health, resource readiness, expeditionary maintenance and logistics operations, munitions operations and combat surge production, and the integration of joint logistics operations. Additionally, the course included temporary duty assignments to ACC Headquarters at Joint Base Langley-Eustis;

the Contingency Response Wing at Travis AFB, California; the Air Force Combat Ammunition Center at Beale AFB, California; United States Transportation Command (USTRANSCOM) and Air Mobility Command (AMC) Headquarters at Scott AFB, Illinois; and Boeing's Joint Direct Attack Munitions (JDAM) factory in Saint Louis, Missouri. In total, each class consisted of nearly 490 in-class academic hours and 700 hours of self-paced studies.³¹

To become a graduate, each student was evaluated on their ability to apply course subject matter through written examinations, practical exercises, and a culminating five-day capstone exercise. Students also earned an Air Force instructor certification which provided the skillset to instruct peers and subordinates on maintenance TTPs upon returning to homestation. Through this curriculum, graduates attained an advanced education in expeditionary logistics and charge to become a producer, instructor, and advisor in their field. As a *producer*, graduates possessed expertise in nine capabilities: operate and function as a sole logistician at deployed locations; operate in austere locations; deploy and sustain a unit's combat capability; respond to developments in combat environments; function as a tactical logistics officer; develop and maintain combat ready units; use and develop TTPs; and become a tactical maintenance leader and expert.³² As an *instructor*, graduates possessed the ability to grow and groom peers and subordinates through their instructor skillset. Finally, as an *advisor*, graduates were charged to utilize their expertise to not only identify challenges to maintenance and munitions operations, but also to develop solutions and courses of action for senior leader decisions.

Throughout the first 10 years of AMMOS, research was conducted to analyze the effectiveness of graduates on maintenance organizations and if there was a return on investment for graduates in the field. However, data has revealed that there really is no quantifiable way to measure the return on investment that a graduate has on an organization's performance. Further,

there is no true objective means to tie the success of an organization to an AMMOS graduate.

Past research on mission capable rates, sortie generation rates, and aircraft readiness rates have concluded that a clear, objective analysis could not be made due to aging aircraft fleets, aged support equipment, and maintenance manning reductions. Despite these factors, in 2009, Headquarters (HQ) ACC and HQ Air Force (HAF)/A4L sponsored a week-long working group to examine the impacts and effectiveness of AMMOS.³³ During this period, approximately 75 Maintenance Group Commanders were surveyed and provided the following favorable assessment:

“Aircraft maintenance is a profession and we need to have those who can take our profession to the next level. It’s [AMMOS] a needed program to develop PhD level maintenance officers; it takes great officers and makes them better. AMMOS is an outstanding method of identifying future maintenance leaders, equipping them with advanced skills and marking them for future assignment consideration. It is very valuable in producing the expertise our AF needs. Great program, curriculum is comprehensive and at the right level and no free lunch—as it should be.”³⁴

In his 2010 research titled, “Advanced Maintenance Officer Training a Focus on AMMOS: Return on Investment...Staying the Course”, Lt Col Scott T. Fike revealed that of 75 Maintenance Group Commanders surveyed, of those responding, 35 percent attributed organizational improvements to an AMMOS graduate’s training and in fulfilling their roles as producers, mentors, and advisors.³⁵ These organizational improvements included positive impacts on unit deployment processes and aircraft fleet health. Additionally, in 2013, the school revealed the successes of its graduates during its 10 year anniversary ceremony. Among them, it was showcased that AMMOS graduates had deployed to 13 separate locations in support of Operations ENDURING FREEDOM, IRAQI FREEDOM, NEW DAWN, ODYSSEY DAWN, MEDUSA, MOUNTAIN THRUST, and NOBLE EAGLE.³⁶ During these deployments, graduates filled critical leadership positions at the expeditionary group and squadron levels with

high success. Away from the AOR, graduates excelled at homestation, earning numerous level awards: 63 wing, 26 Numbered Air Force, 20 Major Command, and 6 USAF.³⁷ In addition to individual awards, graduates were in key leadership positions where units garnered the SECDEF Phoenix Trophy, USAF Gerrity Logistics Awards, MAJCOM Maintenance Effectiveness Awards, and MAJCOM Daedallion Trophies.³⁸ Finally, graduates voiced that their maintenance expertise was integral in securing victories over compliance inspections: assisting in five “Outstanding” Logistics Compliance Assessment Program Inspections, 16 “Excellent” Operational Readiness Inspections, 14 “Excellent” Unit Complaint Inspections, and “Best seen to date” Weapons Safety Programs.³⁹ These stats indicated that there was a direct correlation that linked AMMOS graduates to unit and individual successes throughout the USAF.

A Vision Depleted: 2013-2015

In 2013, AMMOS underwent its first modification when the school changed its name from the USAF Advanced Maintenance and Munitions Officer School to the USAF Advanced Maintenance and Munitions Operations School. Along with this change the CSC was reduced to seven weeks in length. The reduction in course length came in an effort to reduce the annual cost of the school and increase the number of potential graduates from 24 to 95 per year.⁴⁰ With this reduction, the school eliminated TDYs, its instructor certification process, and two practical exercises in an effort to maintain its core curriculum. Although the aircraft and munitions curriculum remained in-tact, academics that focused on base operating support functions were significantly reduced. This change affected the level of instruction on the prescribed cross-functional logistics tasks that was provided in the 14-week course. Additionally, while the school still focused on graduates who filled the role of producer, instructor, and advisor, *producer* capabilities were reduced from the previously mentioned nine capabilities to three:

deploy combat capability, develop combat ready units, and tactical maintenance experts.⁴¹

Along with this change, the school's selection process also was significantly altered.

Until 2013 each student selected to attend AMMOS was hand-picked by the 21X career field developmental team. This new change called for officers to be nominated by their respective wings to each MAJCOM who would fill an allocation set by ACC.

Under the seven-week course AMMOS continued to produce graduates skilled at the operational art of maintenance and munitions employment. Despite achieving its goal to increase the number of graduates in the field, the school would once again face a transformation in late 2015. This change called for a re-focus in the school's tactical level expeditionary logistics curriculum and brought an end to the CSC. Under the direction of ACC, AMMOS graduated its final CSC class, fielding its 350th graduate, before retiring the course.

AMMOS: The Current Path

In late 2015, under the direction of ACC, the school began constructing a course aimed at educating Field Grade Officers with operational and strategic level logistics curriculum. Currently, the full framework of this course is yet to be determined. Until that time, AMMOS has proposed a way to stand firm in its origins of providing tactical level advanced education to the 21X community. In February 2016, ACC/A4 approved the school to develop a 12 week Advanced Sortie Production Course (ASPC).⁴² Although the syllabus for ASPC is currently in draft the academic focus for the course has been determined. Shifting away from expeditionary logistics processes and deployment functions ASPC curriculum will concentrate on homestation employment operations and students obtaining a mastery on operations, maintenance, and the unit mission, workforce management, aircraft fleet management, supply chain and consumption chain management, munitions operations, and mission execution. This shift will alter 76 percent

of AMMOS' late CSC curriculum and significantly reduce or eliminate practical application exercises, exams, case studies, as well as instructor skillset from the school's academia.⁴³ These changes are geared toward ASPC attaining its end goal of graduates possessing the ability to *meet and exceed sortie production requirements.*⁴⁴

In August 2010, then commandant of the USAF Weapons School, Colonel Adrian Spain, made the following statement regarding the importance of his institution's curriculum:

"Without this institution running on all cylinders and producing graduates, the common understanding our Airmen have of the threat, and what it really takes to counter it will atrophy over time... It's not because there won't be really smart and talented folks doing their best, but because they haven't been exposed to higher-end, finer points of their profession...the PhD level of execution that this school provides. So our Airmen will get proficient at some things, but only at what they know and have been exposed to at their local units or from academics, which in most cases will not be sufficient to deal with the threat in today's environment."⁴⁵

As AMMOS prepares to operate under the ASPC construct only time will reveal if its lack in expeditionary curriculum will have a negative impact on logistics officer exposure to the higher-end, finer points of their profession. If this is the case, 21X Airmen may only become proficient at what they know and have been exposed to in logistics functions at their local units. From what the USAF witnessed in past from OAF this knowledge and experience may not be sufficient to deal with the threats of tomorrow's environment.

The Need for 21X Tactical Level Advanced Education

In the aftermath of OAF, the USAF identified that it lacked an expert-level course which instructed logisticians on tactical level concepts and TTP. This absence in logistics employment and sustainment training forced on-the-job training, which led to severe deficiencies where logistics officers were not prepared to perform their wartime duties.⁴⁶ This failure directly affected the ability of aircraft maintenance, munitions, and logistics operations during OAF.

Further adding to the effects of this deficiency, a RAND study conducted in 1999 concluded that a “failure to recognize the time required to provide logistics support or delays caused by logisticians’ having to learn on-the-job may force operational commanders to change plans, thus affecting the air campaign or impeding opportunities to exploit the enemy’s weakness.”⁴⁷ This effect was highlighted by maintenance officers deployed at the time who reported a lack in tactical level logistics expertise in theater. At times, their lack in knowledge negatively impacted combat sortie generation, driving aircraft mission capable rates to fall below 50 percent.⁴⁸ These factors enforced that a lack in logistics officer training created a critical deficiency in the USAF’s deployment strategy and justified the need for tactical level advanced education.⁴⁹

For 13 years AMMOS provided a solution to bridge the gap among logistics officer training requirements, ACS doctrinal principles, and the AEF employment strategy. During this time the USAF had witnessed an increase in operations tempo, numerous rounds of manning reductions, and periods of sequestration. Despite these challenges, there was little room to argue the readiness of our logisticians in support of wartime requirements throughout these years. However, entering 2016, the characteristic of 21X training in the USAF finds itself once again lacking a centralized course of instruction for senior captains that provides the leadership skills and knowledge of the TTPs required to produce combat sorties and associated combat support in contingency operations. As the demands of the USAF will continue to increase in the future, we cannot afford to sacrifice our readiness and capability.⁵⁰ As the current USAF aircraft inventory sits at an all-time high in terms of average age per aircraft, 27 years, the need for tactical level ACS education is needed more than ever to manage the most effective employment of these weapons systems.⁵¹

CSAF General Mark A. Welsh III noted that the Air Force's ability to adapt and respond faster than its adversaries is the single greatest challenge the Service faces over the next 30 years.⁵² He further adds, "to capitalize on this increasingly dynamic environment, the Air Force must aggressively pursue a path toward institutional *strategic agility*... the term "agility" is meant to capture the attributes of flexibility, adaptability, and responsiveness..." "strategic" in this context refers to the national security implications of how we organize, train, equip, and employ our Air Force."⁵³ The question regarding the future of 21X training rests on how the USAF will adapt and respond to the increasing demands on our aircraft and logistics systems and their future employment. To remedy this gap, the following section presents three models for 21X tactical level advanced education that will work to again raise a sense of standards to where it must remain to ensure Air Force logistical readiness over the next 20 years.

A Future with AMMOS: Securing Strategic Agility through 2036

To secure the future of advanced education for logisticians in the USAF, two courses of action (COA) were generated by AMMOS in 2015. Both COAs have been expanded upon to present the best way forward for 21X advanced officer education to ensure future generations of 21X officers maintain tactical level proficiency. Additionally, a third COA is offered which strives to reach a larger pool of logisticians who are unable to attend the in-residence course. They depict how the USAF will advance from its current state of 21X education into the future. Before presenting the COAs, the main characteristics of the course must be highlighted. First, it must be enforced that each COA was constructed utilizing the original goal of AMMOS: to improve the effectiveness of USAF operational wings by producing highly skilled 21X officers who are capable of expanding combat capability by mastering all aspects of ACS. Secondly, both COAs maintain the school's focus to train highly selective mid-to-senior level captain

logisticians from Active Duty, Air National Guard, and the Air Reserve Component. Third, the way forward for the course is with an integration of all 21X Air Force Specialties: aircraft maintenance, munitions and missile maintenance, and logistics readiness officers. Finally, all three COAs presented strongly advocate for the school to remain at Nellis AFB. Being home to the USAF Warfare Center, specializing in testing, tactics, and training, and the 57th Wing, executing the missions of the USAF Weapons School, RED FLAG, GREEN FLAG, and the 561st Joint Tactics Squadron, Nellis AFB is the pinnacle of advanced training in the USAF. Additionally, having been located at Nellis since inception, AMMOS currently has the infrastructure to support either of the following COAs requiring no significant modifications. This includes an allocated dormitory for student utilization. Again, the first two concepts derive from the original make-up of AMMOS. Each COA is presented below:

COA 1, The Weapons School Structure

The Weapons School structure proposes an 18-week CSC offered twice per year with 24 students per class.⁵⁴ This CSC is meant to bring AMMOS back to an alignment with the Weapons School for possible future integration, as was the original intent of the school. As the preferred COA, its approach strives to produce 21X officers possessing similar abilities to that of the Weapons School graduates which are “expected to be experts on all that applies to the Air Force’s cross-domain warfighting capabilities, and possess the ability to solve any problem, under any conditions, with little to no advanced warning.”⁵⁵

COA 2, The Original CSC Structure

The Original CSC Structure proposes a 14-week CSC offered twice per year with 24 students per class.⁵⁶ This course is meant to resurrect the full course curriculum which was instituted during the aforementioned pinnacle years of AMMOS, from 2003-2013 before its

length was reduced due to a demand for graduates in the field and costs. The following table (Table 2) illustrates the academic focus areas of each COA.

Table 2. USAF AMMOS COAs

COA 1	COA 2
Weapons School Core 1 (34-hrs)	Sole Logistics Officer (25-hrs)
Weapons School Core 2 (21-hrs)	Operate in Austere Locations (20-hrs)
Sole Logistics Officer (30-hrs)	Deploy and Sustain Combat Capability (53-hrs)
Operate in Austere Locations (20-hrs)	AEF Next Airpower Team Development (5-hrs)
Deploy and Sustain Combat Capability (62-hrs)	Changes and Developments to Combat Environment (19-hrs)
AEF Next Airpower Team Development (15-hrs)	Tactical Logistics Functions (28-hrs)
Changes and Developments to Combat Environment (31-hrs)	Integrated Operations and Maintenance Planning and Preparation (5-hrs)
Tactical Logistics Functions (28-hrs)	Develop and Maintain Combat Ready Units (60-hrs)
Integrated Operations and Maintenance Planning and Preparation (25-hrs)	Tactical Maintenance Expert (30-hrs)
Develop and Maintain Combat Ready Units (60-hrs)	Use and Development of Operations and Maintenance TTPs (16- hrs)
Tactical Maintenance Expert (35-hrs)	Air Force Instructor Certification (14-hrs)
Use and Development of Operations and Maintenance TTPs (24- hrs)	
Assist ATO Cycle Development (25-hrs)	
Air Force Instructor Certification (14-hrs)	

Adapted from USAF AMMOS, “AMMOS’ Future”, Nellis AFB, NV, 2015.

In addition to the academic focus areas, in 2015 AMMOS identified the cost associated with operating each COA. The figures are illustrated in the following table (Table 3):

Table 3. USAF AMMOS COA Costs

Student Cost	COA 1	COA 2
TDY Cost per Student	\$13,728	\$10,844
Transportation	\$750	\$750
On Base Lodging	\$7,308	\$5,684
Per Diem	\$5,670	\$4,410
Total Annual Student Cost	\$658,944	\$520,512

Adapted from USAF AMMOS, “AMMOS’ Future”, Nellis AFB, NV, 2015.

COA 3, The Hybrid Approach

Both COAs illustrated above are optimal in securing 21X advanced tactical level education in the future but they also come with challenges for both the school and units across the USAF. Aside from the costs associated with operating the course, the ability or acceptance of a unit to lose an officer for the duration of the CSC presents a challenge. This challenge, coupled with the selection process to attend the course, may lead to a pool of highly skilled officers who are unable to attend. To remedy these challenges, a final COA presented is for AMMOS to develop a CSC course which can be completed through a combination of distance learning and in-residence training. Utilizing the academic structure identified in COA 2 above, this course would offer the full range of CSC curriculum in an online forum. By utilizing Blackboard, or an equivalent software structure, AMMOS could execute its academic syllabus with provided lesson material and video recorded instruction. To maintain the academic rigor of the course and ensure an adequate level of comprehension is retained by each student this course would be best managed provided twice per year with an audience of 24 students per class. The following figure (Figure 1) provides an example of the basic course flow:

Figure 1: COA 3 Basic Course Flow

Month 1 (3 weeks)		Month 2 (4 weeks)		Month 3 (4 weeks)		Month 4 (4 weeks)		Month 5 (4 weeks)		Month 6 (3 weeks)	
Readying the Force	EXAM	Preparing the Operational Environment	EXAM	Positioning the Force	EXAM	Employing the Force	EXAM	Sustaining the Force	EXAM	Reconstituting the Force	Hands-On Training / Graduation
Sole Logistics Officer (25-hrs)											
Tactical Logistics Functions (28-hrs)											
Tactical Maintenance Expert (30-hrs)											
AEF Next Airpower Team Development (5-hrs)											
Integrated Operations and Maintenance Planning and Preparation (5-hrs)											
Develop and Maintain Combat Ready Units (60-hrs)											
Changes and Developments to Combat Environment (19-hrs)											
Deploy and Sustain Combat Capability (53-hrs)											

2 week
AMMOS
Reset

Operate in Austere Locations (20-hrs)
Use and Development of Operations and Maintenance TTPs (16- hrs)
2 Week TDY to Nellis AFB: Practical Exercise Execution, Senior Leader Mentorship, Installation tours (COAC, Aircraft, Red Flag, Red Horse, Mortuary Affairs), Hands-on Munitions Exercise

In the figure above, AMMOS curriculum is divided among six blocks of distance learning instruction maintaining the CSC thread the ACS master processes. Each block being approximately four weeks in length which is concluded with an exam. Following block six, students would attend a two week TDY at AMMOS where academics would be reinforced through practical exercises, senior leader mentorship, various tours at Nellis AFB related to course curriculum, and a hands-on munitions production exercise. This option would allow a larger number of 21X officers to have an opportunity to receive an advanced level of education which is not offered anywhere else across the Air Force. Although this COA presents a basic outline for a distance learning alternative, determining the cost associated with implementing the course as well as an executable syllabus under this structure presents a recommendation for further research in this topic. COA 3 presents a healthy and manageable alternative to educating logisticians in the employment of expeditionary logistics functions. However, the implementation of a total distance learning course would pale in comparison to the experience, rigor, and networking opportunities of the resident course. All of which are vital to developing future leaders within the 21X community and in comprehending a higher-end, finer point of the profession.

Conclusion

As one of the most important responsibilities of the USAF is to prepare for the challenges of tomorrow, there is little doubt a new range of foresight, organization, and training is required to advance into the next 20 years. In order to ensure the Air Force remains capable of providing

responsive and effective Global Vigilance—Global Reach—Global Power, it must continue to possess courageous Airmen which can forge the evolution and refinement of its core processes that have endured for nearly 70 years. Inspired by the foresight of General Jumper, the characteristics of the AMMOS CSC provided a way for 21X officers to leverage effects-based logistics to improve combat capability through expertise, proficiency, and leadership in the ACS master processes. For over a decade, this course produced generations of logisticians capable of being producers of combat airpower, instructors to their peers and subordinates, and advisors to senior leaders throughout the Air Force. Until its retirement, the course remained focused on its mission: *to prepare USAF maintenance leaders to win the wars of tomorrow.*⁵⁷ Now, in 2016 the 21X community faces a future of training which lacks this tactical level education. As we approach the next 20 years, the Service’s ability to adapt and respond faster than its potential adversaries will be its greatest challenge. In order for logistics officers to remain relevant in their profession and peak at their abilities against the threats of tomorrow USAF AMMOS must resurrect its CSC course. For if it does not, future 21X leaders run the risk of being proficient only at what they know and have been exposed to at their local units.

End Notes

- ¹ Gen Mark A. Welsh III, “Global Vigilance, Global Reach, Global Power for America”, (August 2013), 1.
- ³ Ibid., 6.
- ⁴ Acquisition Community Connection, “United States Air Force Advanced Maintenance and Munitions Officer School (AMMOS)”, <https://acc.dau.mil> (DAU, 2015).
- ⁵ Ibid.
- ⁶ Lt Col Michael W. Lamb, Sr., *Operation Allied Force Golden Nuggets for Future Campaigns*, (Maxwell AFB, AL: Air University Press, 2002), 1.
- ⁹ Lamb, *Operation Allied Force*, 16.
- ¹¹ Kristin F. Lynch et al., *The Air Force Chief of Staff Logistics Review: Improving Wing Level Logistics*, RAND (2005), xv.
- ¹² Ibid., xvi.
- ¹³ Gen John P. Jumper, Air Force Chief of Staff, Chief’s Sight Picture, Subject: Combat Wing Organization (28 May 2002).
- ¹⁴ Maj Reggie J. Hall, “Evolution of the Air Force Expeditionary Logistics School: A Revolutionary Approach to the Employment of Combat Support,” *Aerospace Power Journal: Spring 2002 Vol xvi., no2.*, 115.
- ¹⁵ Maj Lindsay and Matyi, CSAF Logistics Review, 7.
- ¹⁶ Hall, “Evolution of the Air”, 112.
- ¹⁷ Charles L. Webb III, “Why a PHD in Maintenance”, (Maxwell, AFB, AL: Air University Press, 2002), 18.
- ¹⁸ Lt Col Gregory B. Lowe, “USAF AMMOS Commandant Welcome” (lecture, USAF AMMOS, Nellis AFB, NV), 2015.
- ¹⁹ Maj Hall, “Evolution of the Air”, 113.
- ²⁰ Lt Col Scott T. Fike, “Advanced Maintenance Officer Training A focus on AMMOS: Return on Investment...Staying the Course, (Maxwell AFB, AL: Air Command and Staff College, 2000), 8.
- ²¹ Maj Hall, “Evolution of the Air”, 118.
- ²² Ibid., 114.
- ²³ Ibid.
- ²⁴ Ibid., 117.
- ²⁵ USAFAMMOS, “CSC Class 13A Graduation Script”, (USAF AMMOS, Nellis AFB, NV) 2013, 5.
- ²⁶ Ibid.
- ²⁷ Ibid., 4.
- ²⁸ Ibid., 5.
- ²⁹ Lt Col Lowe, “USAF AMMOS”.
- ³⁰ Lt Col Lowe, “USAF AMMOS”.
- ³¹ USAF AMMOS, “Academic Overview”, (PowerPoint Presentation, USAF AMMOS, Nellis AFB, NV) 2014.
- ³² USAF AMMOS, “AMMOS’ Future”, (PowerPoint Presentation, USAF AMMOS, Nellis AFB, NV) 2015.
- ³³ Lt Col Fike, Advanced Maintenance Officer Training, 11.
- ³⁴ Ibid.

³⁵ Ibid., 13

³⁶ USAF AMMOS, “Accomplishments of AMMOS Graduates”, (USAF AMMOS, Nellis AFB, NV) 2013.

³⁷ Ibid.

³⁸ Ibid.

³⁹ Ibid.

⁴⁰ Lt Col Lowe, “USAF AMMOS”.

⁴¹ USAF AMMOS, “AMMOS’ Future”.

⁴² USAF AMMOS, “Sortie Production Course Development”, (PowerPoint Presentation, USAF AMMOS, Nellis AFB, NV) 2016.

⁴³ Ibid.

⁴⁴ Ibid.

⁴⁵ Scott Wolf, “US Air Force Weapons School (Part 3)”, Fighter Sweep.Com, <https://fightersweep.com/148/u-s-air-force-weapons-school-part-3> (Assessed 2 May 2016).

⁴⁶ Maj Hall, “Evolution of the Air”, 115.

⁴⁷ Ibid., 116.

⁴⁸ Capt Ben Davis, “War Stories, Great Expectations . . . ,” *The Exceptional Release*, no. 69 (Spring 1998): 13, 15.

⁴⁹ Maj Hall, “Evolution of the Air”, 115.

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